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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/694,795

10/29/2003

Hidekazu Tsuruoka

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EXAMINER

HERNANDEZ, NELSON D

ART UNIT

PAPER NUMBER

2622

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/694,795

Applicant(s)

TSURUOKA ET AL.

Examiner

Nelson D. Hernandez

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
2. The disclosure is objected to because of the following informalities: in page 1, line 11, the word "quipped" should be written as "equipped".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1, 6, 10 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Pinto et al., US 2004/0032952 A1.**

Regarding claim 1, Pinto et al. discloses a camera module (See fig. 1) of a lens integrated type incorporating a lens (See lens 13 integrated in camera case 11), an image sensor (Fig. 1: 35) and an image processing circuit (Fig. 1: 43), wherein said image processing circuit has correction means (See fig. 2)

using, as a correction value, a value obtained by raising the distance from the central axis of an optical system including said lens to the second power (Pinto et al. discloses calculating the square of the radius from said lens to a pixel position; see page 2, ¶ 0022 – page 3, ¶ 0023) to correct a light intensity corresponding to the pixel position of said image sensor (Page 2, ¶ 0022 – page 3, ¶ 0023; page 3, ¶ 0031 – page 4, ¶ 0033; page 4, ¶ 0036-0039).

Regarding claim 6, Pinto et al. discloses a camera module (See fig. 1) of a lens integrated type incorporating a lens (See lens 13 integrated in camera case 11), an image sensor (Fig. 1: 35) and an image processing circuit (Fig. 1: 43), wherein said image processing circuit has correction means (See fig. 2) using, as a correction value, a value obtained by concentric distance computation from the central axis of an optical system including said lens to correct a light intensity corresponding to the pixel position of said image sensor (Pinto et al. discloses calculating the distance from the central axis of the lens to a pixel position by calculating square of the radius from said lens to a pixel position; see page 2, ¶ 0022 – page 3, ¶ 0023) (See also page 3, ¶ 0031 – page 4, ¶ 0033; page 4, ¶ 0036-0039).

Regarding claim 10, Pinto et al. discloses a camera module (See fig. 1) of a lens integrated type incorporating a lens (See lens 13 integrated in camera case 11), an image sensor (Fig. 1: 35) and an image processing circuit (Fig. 1: 43), further comprising selection means selecting the output of said image sensor and the output of said image processing circuit for output (Page 2, ¶ 0022 – page 3, ¶ 0023; page 3, ¶ 0031 – page 4, ¶ 0033; page 4, ¶ 0036-0039).

Regarding claim 11, Pinto et al. discloses that said image processing circuit has correction means (See fig. 2: 71) correcting a light intensity corresponding to the pixel position of said image sensor according to the distance from the central axis of an optical system including said lens (Pinto et al. discloses calculating the square of the radius from said lens to a pixel position (page 2, ¶ 0022 – page 3, ¶0023) to correct a light intensity corresponding to the pixel position of said image sensor) (Page 2, ¶ 0022 – page 3, ¶0023; page 3, ¶ 0031 – page 4, ¶ 0033; page 4, ¶ 0036-0039).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinto et al., US 2004/0032952 A1 in view of Niikawa, US 2002/0135688 A1.**

Regarding claim 2, Pinto et al. discloses calculating the distance for the central axis position to a pixel position by using a predetermined equation but does not explicitly disclose obtaining said correction value by adding a value obtained by raising the distance from the central axis of said optical system in the horizontal direction to the second power and a value obtained by raising the

Art Unit: 2622

distance from the central axis of said optical system in the vertical direction to the second power.

However, Niikawa teaches a camera module (See figs. 2-5) that performs correction to shading caused by the lens system (See fig. 5: 3) of the camera, wherein the distance from the central axis of the lens to a pixel position is calculated by adding a value obtained by raising the distance from the central axis of said optical system in the horizontal direction (x axis) to the second power (x^2) and a value obtained by raising the distance from the central axis of said optical system in the vertical direction (y axis) to the second power (y^2) (Niikawa teaches that the distance is calculated using the equation $r = \sqrt{x^2 + y^2}$; see col. 16, ¶ 0228-0232) and wherein said distance is used to calculate a correction value adjust the shading of said pixel (Page 1, ¶ 0012; page 2, ¶ 0056 – page 3, ¶ 0057; page 5, ¶ 0085; page 13, ¶ 0192-0193; page 16, ¶ 0228-0232).

Therefore, taking the combined teaching of Pinto et al. in view of Niikawa as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Pinto et al. to use a correction value that is determined by calculating the distance from the central axis to a pixel position by adding a value obtained by raising the distance from the central axis of said optical system in the horizontal direction to the second power and a value obtained by raising the distance from the central axis of said optical system in the vertical direction to the second power. The motivation to do so would have been to have an alternative method to calculate an accurate distance value from a

Art Unit: 2622

central axis to a particular pixel position determined using vertical and horizontal position in the image sensor.

Regarding claim 3, the combined teaching of Pinto et al. in view of Niikawa as applied to claim 2 teaches obtaining said correction value by concentric distance computation by adding a value obtained by raising the distance from the central axis of said optical system in the horizontal direction to the second power and a value obtained by raising the distance from the central axis of said optical system in the vertical direction to the second power (Page 1, ¶ 0012; page 2, ¶ 0056 – page 3, ¶ 0057; page 5, ¶ 0085; page 13, ¶ 0192-0193; page 16, ¶ 0228-0232). Grounds for rejecting claim 2 apply here.

Regarding claim 4, Pinto et al. discloses a nonvolatile memory storing said correction value as a function corresponding to the characteristic of an optical system including said lens.

Regarding claim 5, Pinto et al. discloses a volatile memory rewritable from outside and storing said correction value as a function corresponding to the characteristic of an optical system including said lens (Page 3, ¶ 0024).

7. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niikawa, US 2002/0135688 A1 in view of Nakamura, US 2002/0008760 A1.

Regarding claim 7, Niikawa discloses a camera module (See figs. 2-5) of a lens integrated type incorporating a lens (see lenses 300 and 301 integrated in camera 1 as shown in fig. 3), an image sensor (Figs. 3: 303 and 5: 303) and an

Art Unit: 2622

image processing circuit (Fig. 5: 120), wherein said image processing circuit has correction means (See fig. 5) using, as a correction value, a value obtained by raising the distance from the central axis of an optical system including said lens in the horizontal direction (x axis) to the second power (x^2) or a value obtained by raising the distance from the central axis of said optical system in the vertical direction (y axis) to the second power (y^2) (Niikawa teaches that the distance is calculated using the equation $r = \sqrt{x^2 + y^2}$ (see col. 16, ¶ 0228-0232) and wherein said distance is used to calculate a correction value adjust the shading of said pixel (Page 1, ¶ 0012; page 2, ¶ 0056 – page 3, ¶ 0057; page 5, ¶ 0085; page 13, ¶ 0192-0193; page 16, ¶ 0228-0232).).

Niikawa does not explicitly disclose that said value is obtained by multiplying a distance value by a predetermined coefficient to correct a light intensity corresponding to the pixel position of said image sensor.

However, Nakamura teaches a camera module (See figs. 1-4) of a lens integrated type incorporating a lens (see lenses 300 and 301 integrated in camera 1 as shown in fig. 3), an image sensor (Figs. 3: 303 and 5: 303) and an image processing circuit (Fig. 4: 2111), wherein said image processing circuit has correction means using (See fig. 5), wherein said image processing circuit has correction means (See fig. 6) using, as a shading correction value, a value obtained by multiplying a distance value from the central axis to a pixel by a predetermined coefficient (See figs. 11 and 12) to correct a light intensity corresponding to the pixel position of said image sensor (Page 1, ¶ 0013; page 5, ¶ 0092 – page 6, ¶ 0097).

Although Nakamura does not explicitly disclose that the coefficient is being multiplied by the distance in the horizontal direction raised to the second power or to the vertical direction raised to the second power, one of ordinary skill in the art would realize at the time the invention was made to modify Niikawa with the concept of multiplying a correction coefficient by a particular distance from the central axis to a pixel position as taught by Nakamura to have a correction coefficient multiplied by either the horizontal distance raised to the second power (x^2 in Niikawa) or the vertical distance raised to the second power (y^2 in Niikawa) (which would be multiplied since the distance in Niikawa is determined using the horizontal distance raised to the second power and the vertical distance raised to the second power, so that a coefficient is multiplied by both the horizontal and vertical distances). The motivation to do so would have been to improve the image quality of a captured image by correcting the deterioration of the image quality as suggested by Nakamura (Page 1, ¶ 0013).

Regarding claim 8, limitations can be found in claim 7.

Regarding claim 9, limitations can be found in claim 7.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson D. Hernandez whose telephone number is (571) 272-7311. The examiner can normally be reached on 8:30 A.M. to 6:00 P.M..

Art Unit: 2622

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on (571) 272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nelson D. Hernandez
Examiner
Art Unit 2622

NDHH
February 14, 2007


TUAN HO
PRIMARY EXAMINER